

**AMENDMENTS TO THE CLAIMS**

1. (Currently Amended) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein said detector unit comprises a plurality of radiation detectors for detecting radiation and a plurality of said radiation detectors are arranged in a radius direction of said detector support member, wherein said radiation detectors comprise a plurality of semiconductor members, detection signal output electrodes and common potential electrodes, said semiconductor members being arranged in parallel and positioned between said detection signal output electrodes and common potential electrodes; and

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors outputting  $\gamma$ -ray detection signals being arranged in said radius direction.

2. (Currently Amended) The radiological imaging apparatus according to claim 1, wherein said detector unit comprises:

a detector support substrate attached to said detector support member in a detachable manner, ~~wherein the plurality of~~ wherein the plurality of at least some of said radiation detectors

~~and the plurality of said other radiation detectors~~ are arranged on said detector support substrate; and

a plurality of wires provided for said detector support substrate and connected to each of said radiation detectors for transmitting detection signals outputted from said radiation detectors.

3. (Currently Amended) The radiological imaging apparatus according to claim [[1]] 2, further comprising an image creation apparatus which creates images of said examinee using the output signals of said radiation detectors.

4. (Cancelled).

5. (Currently Amended) A radiological imaging apparatus comprising:

a ring-shaped detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and in the circumferential direction of said detector support member which includes said plurality of detector units attached to said detector support member in a detachable manner, wherein said detector unit comprises a plurality of radiation detectors for detecting radiation and is provided with a plurality of said radiation detectors in different positions in the radius direction of said detector support member, wherein said radiation detectors comprise a plurality of semiconductor members, detection signal output electrodes and common potential electrodes, said semiconductor members being arranged in parallel and

positioned between said detection signal output electrodes and common potential electrodes; and

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors being arranged in said radius direction.

6. (Currently Amended) The radiological imaging apparatus according to claim 5, wherein said detector unit comprises:

a detector support substrate attached to said detector support member in a detachable manner;

~~the plurality of at least~~ some of said radiation detectors ~~and the plurality of said other radiation detectors~~ being arranged on said detector support substrate; and

a plurality of wires provided for said detector support substrate and connected to each of said radiation detectors for transmitting detection signals outputted from said radiation detectors.

7. (Original) The radiological imaging apparatus according to claim 5, further comprising an image creation apparatus which creates images of said examinee using the output signals of said radiation detectors.

8. (Cancelled).

9. (Currently Amended) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein each said detector unit is provided with a plurality of radiation detectors which detect  $\gamma$ -rays and is arranged in a radius direction of said detector support member, wherein said radiation detectors comprise a plurality of semiconductor members, detection signal output electrodes and common potential electrodes, said semiconductor members being arranged in parallel and positioned between said detection signal output electrodes and common potential electrodes; and

a signal processing apparatus for processing  $\gamma$ -ray detection signals outputted from said radiation detectors and for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals on the basis of said  $\gamma$ -ray detection signals, said radiation detectors being arranged in said radius direction.

10. (Cancelled).

11. (Original) The radiological imaging apparatus according to claim 9, further comprising an image creation apparatus which creates images including areas where radiopharmaceutical in the body of said examinee is concentrated using the output information from said signal processing apparatus.

12. (Original) The radiological imaging apparatus according to claim 9, wherein said detector unit comprises:

a detector support substrate attached to said detector support member in a detachable manner;

~~a plurality of~~ at least some of said radiation detectors and ~~a plurality of said other radiation detectors~~ being set in said detector support substrate; and

a plurality of wires provided on said detector support substrate and connected to each of said radiation detectors for transmitting  $\gamma$ -ray detection signals outputted from said radiation detectors, and said signal processing apparatus gets said  $\gamma$ -ray detection signals transmitted through said wires.

13. (Original) The radiological imaging apparatus according to claim 12, wherein said wires are provided in said detector support substrate.

14. (Original) The radiological imaging apparatus according to claim 12, further comprising an image creation apparatus which creates images including areas where radiopharmaceutical in the body of said examinee is concentrated using the output information from said signal processing apparatus.

15. (Original) The radiological imaging apparatus according to claim 14, wherein said wires are provided in said detector support substrate.

16. (Currently Amended) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

an X-ray source which moves around said bed and radiates X-rays;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein said detector units are provided with a plurality of radiation detectors for detecting radiation, and said radiation detectors are arranged in a radius direction of said radiation detector support member, and at least one of said radiation detectors outputs X-ray detection signals and  $\gamma$ -ray detection signals, wherein said radiation detectors comprise a plurality of semiconductor members, detection signal output electrodes and common potential electrodes, said semiconductor members being arranged in parallel and positioned between said detection signal output electrodes and common potential electrodes; and

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors being arranged in said radius direction.

17. (Cancelled).

18. (Currently Amended) The radiological imaging apparatus according to claim [[17]] 16, wherein ~~said~~ at least some of said radiation detectors ~~and said other radiation detectors~~ are arranged rectilinearly.

19. (Previously Presented) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

an X-ray source which moves around said bed and radiates X-rays;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein each said detector unit is provided with a plurality of radiation detectors for detecting radiation and some of said radiation detectors being for detecting said radiation that has passed through other said radiation detectors, and at least said some radiation detectors output both said X-ray detection signals and  $\gamma$ -ray detection signals; and

an X-ray source transport apparatus which transports said X-ray source in said longitudinal direction.

20. (Currently Amended) The radiological imaging apparatus according to claim 19, wherein ~~said at least some of said radiation detectors and said other radiation detectors~~ at least some of said radiation detectors are arranged rectilinearly.

21. (Original) The radiological imaging apparatus according to claim 16, further comprising a tomographic image creation apparatus which creates tomographic images using first information obtained from said  $\gamma$ -ray detection signals and second information obtained from said X-ray detection signals.

22. (Original) The radiological imaging apparatus according to claim 16, further comprising:

a first  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said first radiation detectors which output both said X-ray detection signals and said  $\gamma$ -ray detection signals and an X-ray signal processing for getting said X-ray detection signals provided for each of said first radiation detectors;

a second  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said second radiation detectors which do not output said X-ray detection signals but output said  $\gamma$ -ray detection signals provided for each of said second radiation detectors;

a counting apparatus which receives output signals from said first  $\gamma$ -ray signal processing apparatus and said second  $\gamma$ -ray signal processing apparatus and outputs information such as position information of each of a pair of said radiation detectors which have detected said  $\gamma$ -rays within a set time and count information of said detected  $\gamma$ -rays; and

a tomographic image creation apparatus which creates tomographic image information using said position information, said count information and output information of said X-ray signal processing apparatus.

23. (Original) The radiological imaging apparatus according to claim 22, wherein said radiation detectors are semiconductor radiation detectors.

24. (Previously Presented) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

an X-ray source which moves around said bed and radiates X-rays;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein each said detector unit is provided with a plurality of



semiconductor radiation detectors for detecting radiation and some of said semiconductor radiation detectors being for detecting said radiation that has passed through other said radiation detectors, and at least said some semiconductor radiation detectors output both said X-ray detection signals and  $\gamma$ -ray detection signals;

a first  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said first semiconductor radiation detectors which output both said X-ray detection signals and said  $\gamma$ -ray detection signals and an X-ray signal processing for getting said X-ray detection signals provided for each of said first semiconductor radiation detectors;

a second  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said second semiconductor radiation detectors which do not output said X-ray detection signals but output said  $\gamma$ -ray detection signals provided for each of said second semiconductor radiation detectors;

a counting apparatus which receives output signals from said first  $\gamma$ -ray signal processing apparatus and said second  $\gamma$ -ray signal processing apparatus and outputs information such as position information of each of a pair of said semiconductor radiation detectors which have detected said  $\gamma$ -rays within a set time and count information of said detected  $\gamma$ -rays; and

a tomographic image creation apparatus which creates tomographic image information using said position information, said count information and output information of said X-ray signal processing apparatus,

wherein said semiconductor radiation detectors comprise three or more semiconductor elements having at least two surfaces and arrange anode electrodes and cathode electrodes alternately between said different semiconductor elements.

25. (Previously Presented) A radiological imaging apparatus comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

an X-ray source which moves around said bed and radiates X-rays;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein each said detector unit is provided with a plurality of semiconductor radiation detectors for detecting radiation and some of said semiconductor radiation detectors being for detecting said radiation that has passed through other said radiation detectors, and at least said some semiconductor radiation detectors output both said X-ray detection signals and  $\gamma$ -ray detection signals;

a first  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said first semiconductor radiation detectors which output both said X-ray detection signals and said  $\gamma$ -ray detection signals and an X-ray signal processing for getting said X-ray detection signals provided for each of said first semiconductor radiation detectors;

a second  $\gamma$ -ray signal processing apparatus for getting said  $\gamma$ -ray detection signals from said second semiconductor radiation detectors which do not output said

X-ray detection signals but output said  $\gamma$ -ray detection signals provided for each of said second semiconductor radiation detectors;

a counting apparatus which receives output signals from said first  $\gamma$ -ray signal processing apparatus and said second  $\gamma$ -ray signal processing apparatus and outputs information such as position information of each of a pair of said semiconductor radiation detectors which have detected said  $\gamma$ -rays within a set time and count information of said detected  $\gamma$ -rays; and

a tomographic image creation apparatus which creates tomographic image information using said position information, said count information and output information of said X-ray signal processing apparatus,

wherein said semiconductor radiation detector has a multilayered structure with an even number of semiconductor elements, forms common anode electrodes and cathode electrodes between said adjacent semiconductor elements in said semiconductor radiation detectors and forms common cathode electrodes on both the mutually facing sides of the adjacent semiconductor radiation detectors.

26. (Previously Presented) The radiological imaging apparatus according to claim 2, wherein said wires are provided in said detector support substrate.

27. (Currently Amended) ~~The A~~ radiological imaging apparatus ~~according to claim 3,~~ comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein said detector unit comprises a plurality of radiation detectors for detecting radiation and a plurality of said radiation detectors are arranged in a radius direction of said detector support member, wherein said radiation detectors comprise at least three semiconductor elements each having at least two surfaces, and detection signal output electrodes and common potential electrodes are alternately arranged between said different semiconductor elements;

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors outputting  $\gamma$ -ray detection signals being arranged in said radius direction; and

an image creation apparatus which creates images of said examinee using the output signals of said radiation detectors.

28. (Currently Amended) The A radiological imaging apparatus according to ~~claim 3~~, comprising:

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein said detector unit comprises a plurality of radiation

detectors for detecting radiation and a plurality of said radiation detectors are arranged in a radius direction of said detector support member, wherein said radiation detectors comprise a plurality of semiconductor members arranged in parallel and detection signal output electrodes and common potential electrodes which are alternatively arranged in connection with said detection signal output electrodes and common potential electrodes;

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors outputting  $\gamma$ -ray detection signals being arranged in said radius direction; and

an image creation apparatus which creates images of said examinee using the output signals of said radiation detectors.

29. (Currently Amended) ~~The~~ A radiological imaging apparatus ~~according to claim 17, comprising:~~

a detector support member which extends in the longitudinal direction of a bed for supporting an examinee and is arranged around said bed;

an X-ray source which moves around said bed and radiates X-rays;

a radiation detection apparatus including a plurality of radiation detector units arranged in the longitudinal direction of said bed and around said bed, said plurality of detector units being attached to said detector support member in a detachable manner, wherein said detector units are provided with a plurality of radiation detectors for detecting radiation, and said radiation detectors are arranged in

a radius direction of said radiation detector support member, and at least one of said radiation detectors outputs X-ray detection signals and  $\gamma$ -ray detection signals, wherein said radiation detectors comprise a plurality of semiconductor members arranged in parallel and detection signal output electrodes and common potential electrodes which are alternatively arranged in connection with said semiconductor members positioned between said detection signal output electrodes and common potential electrodes; and

a  $\gamma$ -ray detection signal processing apparatus for obtaining positional information of said radiation detectors outputting  $\gamma$ -ray detection signals, said radiation detectors being arranged in said radius direction.